

CLAIMS

What Is Claimed Is:

Sub. 91 1. A water jacketed exhaust pipe for marine engines comprising:

5 an elongated inner liner, said liner having a tail end, said tail end defining a first inwardly tapered section;

an elongated outer shell, said shell surrounding said liner about an elongate axis of said pipe, said shell further having a tail end, said shell tail end defining a second inwardly tapered section;

10 a spacer disposed between said outer shell and said inner liner for separating said shell from said liner at to define a volume therebetween, said spacer further defining at least one passageway there through communicating said volume with a second volume outside said exhaust pipe.

2. The water jacketed exhaust pipe for marine engines as in claim 1, wherein a portion of water exiting said at least one passageway is deflected onto said inner liner.

3. The water jacketed exhaust pipe for marine engines as in claim 1, wherein said spacer is a ring.

4. The water jacketed exhaust pipe as set forth in claim 1, wherein said inner liner and said outer shell are cylindrical.

5. The water jacketed exhaust pipe as set forth in claim 4, wherein said inner liner and said outer shell are sized to maintain exhaust gas exiting said inner liner at a velocity of approximately 1.5 feet per second relative to water exiting said outer shell.

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6. The water jacketed exhaust pipe as set forth in claim 1, wherein said inner liner, said outer shell and said spacer are constructed from a corrosion resistant material.

7. The water jacketed exhaust pipe as set forth in claim 1, wherein said inner liner, said outer shell, and said spacer are constructed of stainless steel.

8. The water jacketed exhaust pipe as set forth in claim 1, wherein said first and second inwardly tapered sections are cone shaped.

9. The water jacketed exhaust pipe as set forth in claim 1, wherein at least one of said first and second inwardly tapered sections is curved.

10. The water jacketed exhaust pipe as set forth in claim 1, wherein at least one of said first and second inwardly tapered sections are angled.

11. A water jacketed exhaust pipe for marine engines comprising:

an elongated inner liner, said liner having a tail end, said tail end defining an inwardly tapered section;

an elongated outer shell, said outer shell having a tail end, said shell surrounding said liner about an elongate axis of said pipe;

a spacer angularly disposed between said outer shell and said inner liner and separating said shell from said liner and defining a volume therebetween, said spacer further defining at least one passageway thereby fluidly communicating said volume with a second volume outside said exhaust pipe; and,

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wherein fluid from said first volume is directed toward said outer shell by said at least one passageway.

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~~12.~~₁₄ The water jacketed exhaust pipe for marine engines as in claim 11, wherein said spacer is a ring.

5 14 13¹⁶. The water jacketed exhaust pipe as set forth in claim
11, wherein said inner liner, said outer shell, and said ring are
constructed from a corrosion resistant material.

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14. The water jacketed exhaust pipe as set forth in claim 14, wherein said first and second inwardly tapered sections are curved.

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~~14~~ ^{15.} The water jacketed exhaust pipe as set forth in claim
~~11~~, wherein said first and second inwardly tapered sections are
cone shaped.

^{19.}
14 ~~16.~~ The water jacketed exhaust pipe as set forth in claim
~~11~~, wherein at least one of said first and second inwardly tapered
sections is curved.

14 ^{20.}~~17.~~ The water jacketed exhaust pipe as set forth in claim 11, wherein at least one of said first and second inwardly tapered sections are cone shaped.

20 ~~Sub 9~~ 18. A water jacketed exhaust pipe for marine engines
comprising:

an elongated inner liner forming an exhaust gas duct;
an elongated outer shell, said shell surrounding said

liner about an elongate axis of said pipe, said shell further
25 defining a tail end, said tail end defining an inwardly tapered
section;

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a spacer angularly disposed between said outer shell and said inner liner and separating said shell from said liner and defining a water containing volume therebetween, said spacer further defining at least one passageway thereby communicating
5 said volume with a second volume outside said exhaust pipe;

wherein water from said first volume is directed toward said outer shell by said at least one passageway, said at least one passageway sized for allowing water to flow at a predetermined velocity, and said inner liner sized for allowing exhaust gas to
10 flow at a predetermined velocity approximately 1.5 feet per second greater than said water velocity.

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^{19.} ^{21.} The water jacketed exhaust pipe for marine engines as in claim ¹⁸, wherein said spacer is a ring.

^{23.}
^{21.} ^{20.} The water jacketed exhaust pipe as set forth in claim ¹⁸, wherein at least one of said first and second inwardly tapered sections is curved.

^{24.}
^{21.} ^{21.} The water jacketed exhaust pipe as set forth in claim ¹⁸, wherein at least one of said first and second inwardly tapered sections are cone shaped.

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